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PATENT APPLICATION

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

On Appeal from Group: 1774

Patrick CACERES et al.

Application No.: 10/026,629

Examiner: T. Dicus

Filed: December 27, 2001

Docket No.: 102549.01

For: COOLING ARTICLE INVOLVING EVAPORATION OF WATER FROM A POYMER
ABSORBENT

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

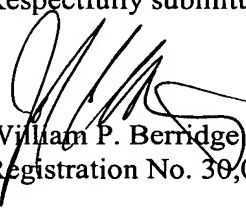
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For the convenience of the Finance Division, two additional copies of this transmittal letter are attached.

Respectfully submitted,


William P. Berridge
Registration No. 30,024

Joel S. Armstrong
Registration No. 36,430

WPB:JSA/ldg

Date: October 1, 2004

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

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POLYMER ABSORBENT

BRIEF ON APPEAL

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Appeal from Group 1774

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400
Attorneys for Appellants

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Cryomed France, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 012402, Frame 0723.

II. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-5, 7-18 and 20-25 are on appeal.

Claims 1-5, 7-18 and 20-25 are pending.

No claims are allowed.

Claims 1-5, 7-18 and 20-25 are rejected.

Claims 6 and 19 are canceled.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention is directed to an article with cooling capability by water desorption from a water-swollen gel, and a method for relieving pain from a sore part of an individual's body with a cooling article. The claimed invention provides such an article that exhibits a high and long-lasting cooling capability when applied externally on a sore part of an individual's body, and is non toxic and easy to use. Page 1, lines 4-11. An object of the claimed invention is thus to provide an article showing cooling properties that are highly improved compared to the prior art, such as prior art conventional ice bags. Page 3, lines 2-9.

According to the claimed invention, the article generally comprises a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls. Page 3, lines 22-28. The polymer absorbent enclosed within the bag is preferably in particulate form, where each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. Page 4, lines 1-23. The article can be used to relieve pain according to the claimed invention by wetting the polymer particles with water through the envelope to swell them into a gel mass filling up the bag, and applying the article to a sore part of the body. Page 5, lines 7-14.

An important feature in embodiments of the claimed invention is that the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Page 5, lines 15-18. That is, an excess amount of polymer particles is present in the bag such that the bag provides insufficient space for all of the particles to reach their fully swollen state, even if sufficient water is present to swell the particles. As a result of this construction, the present inventors unexpectedly discovered that during absorption of water there occurs some expansion of the mass, with light particles not yet completely swollen with water that have a

tendency to be expelled from the center where completely swollen particles concentrate into a gel. At the end of the absorption process there remains, close to the walls of the bag, a layer of particles that would still be able to absorb some water. Those particles are useful to absorb any trace of water, moisture or sweat penetrating into the bag through the envelope, which maintains the latter dry. There is thereby provided a better feeling of comfort for the user, and a better heat transfer across the inner wall of the envelope is achieved. Moreover this layer of not fully swollen particles constitutes an additional barrier to water outlet, which increases the thermal inertia of the article according to the invention. Page 5, lines 18-33.

The cooling article provides a long-lasting cooling effect to an applied surface, beyond the short-term cooling effect provided by traditional ice bags. This is due largely based on the specific core-shell structure of the particles. For example, the specification describes that after an initial thermal shock and high heat transfer from the applied surface, the cooling article continues to extract heat from the surface. However, because of the mechanics of steam and water transfer out of the cooling article, the cooling effect can be provided for periods of up to several days. Page 10, line 17 to page 11, line 22. This is accomplished simply by immersing the cooling article into cold water to wet the polymer particles, rather than filling a conventional ice bag with ice. Page 10, lines 17-18.

Accordingly, in the article of claim 1, there is provided an article with cooling capability by water desorption from a water-swollen gel, comprising: a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water, and wherein the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the

bag when they are in the full swollen state. Claim 1. In another embodiment, the article comprises a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls and made of a non-woven fabric comprising longer threads or fibers of natural or semi-synthetic nature and shorter polyester fibers, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water, and wherein said polymer absorbent has a sodium polyacrylate base, and wherein the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Claim 14.

The claimed invention also provides a method for relieving pain from a sore part of an individual's body with a cooling article comprising a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. The method comprises: wetting said polymer particles with water through said envelope during a sufficient time to swell them into a gel mass filling up said bag, and applying said article on said sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope. Claim 13.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1) Claims 1-5, 7-18 and 20-22 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,669,894 to Goldman ("Goldman") in view of U.S. Patent No. 6,075,177 to Bahia ("Bahia").

2) Claims 1, 3, 7, 9, 13, 21 and 23-25 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,897,297 to Zafiroglu ("Zafiroglu").

3) Claims 2, 8-9, 11, 14-15, 17 and 20 are rejected under 35 U.S.C. §103(a) over Zafiroglu in view of Goldman.

VII. ARGUMENT

The Examiner rejects all of pending claims 1-5, 7-18 and 20-25 under 35 U.S.C. §103(a) as being unpatentable over various combinations of Goldman, Bahia, and Zafiroglu. However, the Examiner has consistently improperly applied the law relating to obviousness. Proper application of the law demonstrates that no prima facie case of obviousness has been shown, and that the claimed invention would not have been obvious over the applied references.

A. Factual Inquiries to Determine Obviousness/Non-Obviousness

Several basic factual inquiries must be made in order to determine obviousness or non-obviousness of claims of a patent application under 35 U.S.C. §103. These factual inquiries are set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966):

Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

The specific factual inquiries set forth in Graham have not been considered or properly applied by the Examiner in formulating the rejection of the subject claims. Particularly, the scope and content of the prior art and the level of ordinary skill in the pertinent art were not properly determined and demonstrated and applied to the claimed invention.

In the present case, proper consideration of the factual inquiries demonstrates nonobviousness of the claimed invention. The cited references do not teach or suggest specifically incorporating into the bag an amount of polymer particles that is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Nor do the cited references teach or suggest any advantages that would be provided thereby. Further, the cited references do not teach or suggest the claimed method for relieving pain from a sore part of an individual's body with a cooling article.

B. Claims 1-5, 7-18 and 20-22 Would Not Have Been Obvious Over Goldman in View of Bahia

Claims 1-5, 7-18 and 20 are rejected under 35 U.S.C. §103(a) over Goldman in view of Bahia. Goldman is cited by the Examiner as disclosing most of the features of the claimed invention. Bahia is cited only for its disclosure of the use of a viscose fiber in a wound dressing, which the Examiner admits is not disclosed in Goldman. However, any combination of Goldman and Bahia would not have rendered obvious the claimed invention.

1. Claims 1-5, 7-12, 14-18 and 20-22

Independent claims 1 and 14 are directed to an article with cooling capability by water desorption from a water-swollen gel. Claims 2-5, 7-12, 15-18 and 20-22 ultimately depend from claim 1 or claim 14. Each of claims 1 and 14 specifies that the article comprises a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. Each of claims 1 and 14 also requires that the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Such articles are nowhere taught or suggested by the cited references.

In contrast to the claimed invention, Goldman is directed to an absorbent member useful in the containment of body fluids such as urine. Goldman discloses that such absorbent members are, for example, disposable diapers, adult incontinence pads and briefs, and catamenial products such as sanitary napkins. See col. 1, lines 19-21 and claims 33-35. The absorbent member has at least one region containing hydrogel-forming absorbent polymer in a concentration of from about 60 to 100% by weight and providing a gel-continuous fluid transportation zone when in a swollen state. This hydrogel-forming

absorbent polymer has: (a) a Saline Flow Conductivity (SFC) value of at least about 30×10^{-7} cm³ sec/g; (b) a Performance under Pressure (PUP) capacity value of at least about 23 g/g under a confining pressure of 0.7 psi (5 kPa); and (c) a basis weight of at least about 10 gsm. The region where this hydrogel-forming absorbent polymer is present has, even when subjected to normal use conditions, sufficient wet integrity such that the gel-continuous zone substantially maintains its ability to acquire and transport body fluids through the gel-continuous zone. See Goldman at Abstract. Bahia is cited for its disclosure of the use of a viscose fiber in a wound dressing. See Bahia at col. 3, lines 40-43.

The Examiner has not established a prima facie case of obviousness of the claimed invention based on Goldman and/or Bahia. The requirements for a prima facie case of obviousness are specified and described in MPEP §2143. According to MPEP §2143, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the references. Second, there must be a reasonable expectation of success. Third, the prior art references must teach or suggest all the claim limitations. The references applied in the Office Action fail to teach or suggest all the claim limitations, or to provide any reasonable expectation of success.

a. The Claimed Invention and Goldman are Different Products

First, Applicants submit that the claimed invention and Goldman are directed to entirely different products. Goldman is directed to a product for absorbing bodily fluids such as urine and menses, and which is disposed of when swollen. The claimed invention is directed to an article with cooling capability by water desorption, which can be used to relieve pain from a sore part of a body. See claims 1 and 14. In use, the article of the claimed invention is first exposed to water to swell the polymer particles, and the particles slowly desorb water over time during use. Thus, the article of Goldman is applied in a dry state and

thrown away when swollen, whereas the article of the claimed invention is applied in the wet or swollen state, and re-used or discarded when desorbed.

Bahia does not render the disclosure of Goldman amenable to the claimed invention. Unlike Goldman, Bahia is directed to a wound dressing. For example, Bahia is directed to wound dressings suitable for deep-seated or chronic wounds such as ulcers. See Bahia at col. 1, lines 12-17.

Based on these differences, one of ordinary skill in the art would not have been motivated to modify the absorbent article of Goldman to provide a cooling article of the claimed invention.

b. The References Do Not Teach or Suggest the Excess Amount of Polymer in the Bag

1. The References Do Not Teach the Claim Limitation

Furthermore, neither Goldman nor Bahia teach or suggest the limitation in claims 1 and 14 that the amount of polymer particles enclosed in the bag is in excess compared to that which would be just required to fill up the bag when they are in the full swollen state. As described above, this limitation indicates that the bag contains a sufficient amount of particles such that the volume limitation of the bag will constrain all of the particles from achieving the full swollen state, because there is insufficient room in the bag to allow all of the particles to achieve the full swollen state. As a result, when the article is wetted with water, the particles absorb water and swell. However, because of the excess amount of polymer particles, and of the restricted internal volume of the envelope (or bag), some of the polymer particles cannot swell completely.

According to the claimed invention, when the internal volume of the envelope is completely occupied by swelled particles, there remains some particles that are not fully swollen. These non-fully-swollen particles are generally located next to the envelope walls,

and are capable of absorbing trace amounts of liquid, such as water, moisture or sweat, penetrating into the bag through the envelope. The results is an improved article for keeping the envelope dry.

Goldman and Bahia fail to teach or suggest at least the limitation regarding the excess amount of polymer particles. Nor do the references teach or suggest any reason to modify the disclosed articles to provide such an excess of polymer particles.

2. The Examiner Fails to Understand or Properly Consider the Instant Claim Limitation

Despite the express claim limitation, the Examiner has essentially ignored this claim limitation in the previous Office Actions. The Examiner has not shown that the limitation is disclosed in, or would have been obvious over, the cited references. Instead, the Examiner has continued to assert, without any clear basis therefor, that this limitation regarding the amount of polymer particles is somehow either a product-by-process limitation (see March 1, 2004, Office Action at page 4, paragraph 5) or an intended use limitation (see March 1, 2004, Office Action at page 5, paragraph 6, neither of which are alleged to limit the product claims. For example, the Examiner argues that a bag that "is able to" contain an excess amount of particles does not limit the claim. See March 1, 2004, Office Action at page 8, paragraph 15. The Examiner thus suggested claiming the actual weight of polymer particles in the bag. Id.

These statements by the Examiner demonstrate that the Examiner has clearly improperly considered the instant claims. First, the claims do not state that the bag "is capable of" containing a certain amount. Rather, the claims expressly state that the bag does contain an amount of polymer particles that "is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state." This limitation is neither in intended use or product-by-process form, but rather is an express product limitation in a product claim.

For example, only for the purposes of explanation, if a bag had sufficient volume only to contain 100 fully swollen polymer particles, the instant claims would require that the bag initially contain more than 100 polymer particles. During use, therefore, not all of the polymer particles could become fully swollen, because the volume of the bag would not be sufficient to contain all of the polymer particles in their fully swollen state. As an analogy, again only for comparison purposes, the claimed article is similar to a bag of popcorn where the bag contains too many popcorn kernels for the final volume of the bag -- when the kernels are popped, the bag does not have sufficient volume to allow for all of the kernels to fully pop, thus the final product would have a number of non-fully popped kernels. While the actual popping of kernels in the popcorn bag or the swelling of polymer particles in the claimed article may be processes, the number of kernels in the popcorn bag or the number of polymer particles in the claimed article are actual express product limitations.

Second, the Examiner's suggestion to instead claim "the ACTUAL weight percent of polymer particles added to make the end product" demonstrates an improper understanding of the claimed invention. It will be readily apparent that the weight percent of polymer particles may change depending, for example, upon the volume of the specific bag, the type of polymer particles, and the like. Applicants have instead chosen to claim their invention as presently presented, in a manner that clearly defines the invention, and in a manner that is not in the form of an intended use or product-by-process. Rather, the instant claim language defines and distinguishes the amount of contained polymer particles enclosed in the bag, by specifically defining the amount with reference to an amount that would fill the bag in the fully swollen state.

For these reasons alone, the claimed invention would not have been obvious over the cited references.

c. There Was No Motivation to Modify the Cited References

Furthermore, Applicants submit that one of ordinary skill in the art would not have been motivated to provide the claimed invention based on the cited references. In Goldman and Bahia, the purpose of the contained particles is to swell and retain liquid. However, providing an excess of polymer particles would be contrary to the objectives of the references, since the excess of particles would be expected to retain less liquid, or at least to retain the liquid less efficiently.

Still further, the different objectives of the claimed invention and Goldman would lead to different motivations for the article structures. The claimed invention requires specific limitations with respect to the polymer particles and the envelope (bag). These limitations affect the ability of the article to maintain a cooling effect over an extended period for the relief of pain by slowly desorbing the contained moisture, while maintaining a dry feeling to the individual. Goldman, however, provides an article that must quickly absorb fluids that contact the article, and not allow those fluids to escape. The Goldman structure must thus quickly absorb fluid while not allowing desorption, and while not providing a cooling effect to the individual.

Accordingly, one of ordinary skill in the art based on the cited references would not have been motivated to combine the cited references, and modify the resultant combination to practice the claimed invention.

2. Claim 13

Independent claim 13 defines a method for relieving pain from a sore part of an individual's body with a cooling article comprising a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer

sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. The method comprises: wetting said polymer particles with water through said envelope during a sufficient time to swell them into a gel mass filling up said bag, and applying said article on said sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope. Such a method is also nowhere taught or suggested by the cited references.

As described above, Goldman is directed to an absorbent member useful in the containment of body fluids such as urine. Goldman discloses that such absorbent members are, for example, disposable diapers, adult incontinence pads and briefs, and catamenial products such as sanitary napkins. See col. 1, lines 19-21 and claims 33-35. The absorbent member has at least one region containing hydrogel-forming absorbent polymer in a concentration of from about 60 to 100% by weight and providing a gel-continuous fluid transportation zone when in a swollen state. The region where this hydrogel-forming absorbent polymer is present has, even when subjected to normal use conditions, sufficient wet integrity such that the gel-continuous zone substantially maintains its ability to acquire and transport body fluids through the gel-continuous zone. See Goldman at Abstract.

The present invention is based in part on the discovery that the specific core-shell structure of the polymer particles confer unexpectedly improved properties to the article. In particular, the polymer particles confer to the article in which they are contained, after it is wetted with water, a high and long-lasting cooling capability when it is applied to the skin. The claimed invention provides a high thermal inertia and low heat losses, presumably because the highly cross-linked outer layer of the particles only allow water in the form of vapor to escape from the particle cores, and by slowing water circulation from one particle to another.

None of the cited references teach or suggest the claimed particle structure, or the benefits provided thereby. Goldman discloses an absorbent member having at least one region containing hydrogel-forming absorbent polymer. See Goldman at Abstract. Bahia discloses a wound dressing made of absorbent fibers, which is intended to be applied on a wound to absorb fluids.

According to the methods of Goldman and Bahia, the disclosed articles are applied to an application site, which is preferably initially dry. The articles then subsequently absorb liquid that may be generated at the application site. Thus, for example, the article of Goldman is applied in a dry state and is used to absorb bodily fluids such as urine and menses. When the article is partially swollen, or after a period of time of use, the article is removed and discarded, and a new dry article may be applied. Likewise, the article of Bahia is applied in a dry state to a wound site and is used to absorb bodily fluids such as blood or exudates exiting from the wound. When the article is partially swollen, or after a period of time of use, the article is removed and discarded, and a new dry article may be applied.

In contrast, the claimed invention requires that the article is first wetted with water through the envelope during a sufficient time to swell the polymer particles into a gel mass filling up the bag, and then applying the article on a sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope. The claimed process thus applies a wetted, swollen article to the application site.

Clearly, modifying the methods of Goldman or Bahia to practice the claimed invention would destroy the very usefulness of Goldman and Bahia. For example, it would not have been obvious to apply a wet diaper to a baby (Goldman) or to apply a wet, swollen dressing to a wound (Bahia). One of ordinary skill in the art would have understood that first

wetting the articles of Goldman or Bahia prior to application to the patient, would result in decreased future absorption by the article without providing any initial benefits.

Likewise, one of ordinary skill in the art would not have been motivated to use the claimed core-shell polymer particles in the articles of Graham or Bahia, where the article is intended to provide sustained release of the contained compositions to an animal or human. Use of such particles, which would provide a barrier to liquid transport, would destroy the very purpose of the article of Goldman.

Accordingly, Applicants submit that the cited references do not teach or suggest the claimed invention, either alone or in combination. The references do not teach or suggest all of the claim limitations, and do not provide any motivation for one of ordinary skill in the art to have combined the references in the manner asserted in the Office Action.

Accordingly, the claimed invention of claim 13 would not have been obvious over Goldman in view of Bahia. Reconsideration and withdrawal of the rejection are respectfully requested.

C. Claims 1, 3, 7, 9, 13, 21 and 23-25 Would Not Have Been Obvious Over Zafiroglu

Claims 1, 3, 7, 9, 13, 21 and 23-25 are rejected as having been obvious over Zafiroglu. The Examiner argues that Zafiroglu, like Goldman discussed above, discloses all of the limitations of independent claims 1 and 13, and the specified dependent claims. Applicants respectfully disagree.

1. Claims 1, 3, 7, 9, and 21

Independent claim 1 is discussed above. As described, claim 1 specifies that the article comprises a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of

water from a particle to another during desorption of absorbed water. Claim 1 also requires that the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Such articles are nowhere taught or suggested by the cited reference.

In contrast to the claimed invention, Zafiroglu is directed to a hot or wet compress having two outer layers, at least one of which is an elastic, water-permeable fabric. Abstract. The article can be used as a medical bandage, to treat burns, as a wet compress, for wrapping cut tree trunks, for beauty care, and the like. Col. 2, lines 18-22.

As with Goldman and Bahia, above, the Examiner has likewise not established a prima facie case of obviousness of the claimed invention based on Zafiroglu.

For example, Zafiroglu fails to teach or suggest the limitation in claim 1 that the amount of polymer particles enclosed in the bag is in excess compared to that which would be just required to fill up the bag when they are in the full swollen state. As described above, this limitation indicates that the bag contains a sufficient amount of particles such that the volume limitation of the bag will constrain all of the particles from achieving the full swollen state, because there is insufficient room in the bag to allow all of the particles to achieve the full swollen state. As a result, when the article is wetted with water, the particles absorb water and swell. However, because of the excess amount of polymer particles, and of the restricted internal volume of the envelope (or bag), some of the polymer particles cannot swell completely.

Zafiroglu, like Goldman and Bahia, fails to teach or suggest at least the limitation regarding the excess amount of polymer particles. Nor do the references teach or suggest any reason to modify the disclosed articles to provide such an excess of polymer particles. Although Zafiroglu teaches that the article contains swellable particles, Zafiroglu is silent with respect to the amount of swellable particles in relation to the volume of the bag containing the particles.

Zafiroglu nowhere teaches or suggests that an excess of particles should be included, such that the bag cannot allow all of the particles to achieve a fully swollen state. Nor does Zafiroglu teach or suggest any benefits that could be provided thereby.

Accordingly, one of ordinary skill in the art based on the cited reference would not have been motivated to practice the claimed invention.

2. Claims 13 and 25

Independent claim 13 is also discussed above, and defines a method for relieving pain from a sore part of an individual's body with a cooling article comprising a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. The method comprises: wetting said polymer particles with water through said envelope during a sufficient time to swell them into a gel mass filling up said bag, and applying said article on said sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope. Claim 25 depends from claim 13. Such a method is also nowhere taught or suggested by the cited reference.

As described above, Zafiroglu is directed to a hot or wet compress having two outer layers, at least one of which is an elastic, water-permeable fabric. Abstract. The article can be used as a medical bandage, to treat burns, as a wet compress, for wrapping cut tree trunks, for beauty care, and the like. Col. 2, lines 18-22.

a. Zafiroglu Does Not Teach the Claimed Core-Shell Structure

According to claim 13, the polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences and a shell of more cross-

linked polymer sequences. The present inventors discovered that such a specific core-shell structure, having a highly cross-linked outer layer shell, forms an expandable lattice that facilitates motion of the particles within the bag, but avoids the problem of the swollen particles forming a hard gel mass. Zafiroglu does not teach or suggest such a core-shell structure.

As a result of the claimed core-shell structure, the particles move freely within the bag, flowing over and around one another. As a result of this free flow within the bag, the particles are better able to distribute themselves within the bag to provide improved water absorption by the particles. This in turn results in a more homogeneous distribution of the cold effect on the surface of the bag.

In contrast, Zafiroglu teaches polymer particles that do not have a core-shell structure. The polymer particles of Zafiroglu are simply dispersed with a solid diluent, which can be wood pulp and synthetic polyethylene pulp. See Zafiroglu at col. 3, lines 8-24. In this mixture, the polymer particles form only 5-30% of the filling material, with the pulp mixture forming the remainder. Col. 3, lines 8-12. Zafiroglu describes that the diluent pulp filling material "prevents packing of the hydrocolloidal material and ensures that all of the hydrocolloidal material is available to absorb water." Col. 4, lines 9-12.

The solution taught by Zafiroglu is thus different from that of the claimed invention. While Zafiroglu teaches use of only a small percentage of a superabsorbent polymer in a high percentage of solid diluent, the claimed invention requires the use of a polymer absorbent that is in particulate form having a core of less cross-linked polymer sequences and a shell of more cross-linked polymer sequences, without a required solid diluent. Not only does Zafiroglu not teach or suggest the claimed core-shell structure of the polymer particles, but Zafiroglu instead teaches specifically different superabsorbent particles dispersed in a solid diluent. Zafiroglu thus does not teach or suggest the claimed invention.

b. Zafiroglu Does Not Teach the Claimed Method

The present claimed invention is based in part on the discovery that the specific core-shell structure of the polymer particles confer unexpectedly improved properties to the article. In particular, the polymer particles confer to the article in which they are contained, after it is wetted with water, a high and long-lasting cooling capability when it is applied to the skin. The claimed invention provides a high thermal inertia and low heat losses, presumably because the highly cross-linked outer layer of the particles only allow water in the form of vapor to escape from the particle cores, and by slowing water circulation from one particle to another.

Zafiroglu fails to teach or suggest the claimed method, or the benefits provided thereby. Zafiroglu discloses an absorbent member that can be used as a wet compress, but does not describe the method for relieving pain with a cooling article of the claimed invention.

According to the methods of Zafiroglu, the disclosed article when used as a wet compress is applied to an application site, and provides action in relation to the liquid used to wet the article. Thus, for example, the Example in Zafiroglu describes a cooling effect, but only when the article is wetted with ice water. As shown in the Example, even that cooling effect decreases over time as the ice water heats up. The Example demonstrates that the cooling effect of Zafiroglu depends upon the water used to wet the article -- if the water is no longer iced or cold, then little or no cooling effect is provided.

In contrast, the claimed invention requires that the article is first wetted with water through the envelope during a sufficient time to swell the polymer particles into a gel mass filling up the bag, and then applying the article on a sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope. The cooling effect of

the claimed invention is provided by allowing the water vapor that is desorbed from the polymer particles to escape through an opposed outer wall of said envelope, while absorbing liquid generated on the application site.

Furthermore, the high and long-lasting cooling effect provided by the claimed method is attributed to the specifically claimed core-shell structure of the polymer particles, which as described above is not taught or suggested by Zafiroglu. The core-shell structure provides a water absorption-desorption mechanism that affects heat transfer from the applied surface, and provides an extended cooling effect. The claimed method does not rely solely upon the temperature of the water used to wet the polymer particles, to provide a cooling effect. In contrast, Zafiroglu's mixture of a low percentage of polymer particles and a high percentage of solid diluent provides a cooling effect attributed only to the temperature of the water; as the water warms up, the cooling effect is lost. The claimed core-shell structure confers an improved cooling efficiency to the method, which is neither taught nor suggested by Zafiroglu.

The claimed method thus provides a cooling effect through water absorption and desorption, rather than through simply the presence of ice water.

c. Conclusion

Accordingly, Applicants submit that the cited reference to Zafiroglu does not teach or suggest the claimed invention. The reference does not teach or suggest all of the claim limitations, and does not provide any motivation for one of ordinary skill in the art to have combined the reference to practice the claimed invention.

Accordingly, the claimed invention of claim 13 would not have been obvious over Zafiroglu. Reconsideration and withdrawal of the rejection are respectfully requested.

3. Claims 23 and 24

Claim 23 depends from claim 13, and thus includes all of its limitations, and thus is patentable over Zafiroglu for all of the reasons described above. Claim 23 further specifies that the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Claim 24 depends from claim 23. Claims 23 and 24 are further patentable over Zafiroglu.

Zafiroglu fails to teach or suggest at least the limitation regarding the excess amount of polymer particles. Zafiroglu merely discloses that its polymer particles (which as described above are different from the claimed core-shell polymer particles) are present in an amount of only from 5-30% of the filling material, with the pulp mixture solid diluent forming the remainder. Col. 3, lines 8-12. Although Zafiroglu teaches that the article contains swellable particles, the reference is silent with respect to the amount of swellable particles in relation to the volume of the bag containing the particles in their swollen state. However, because Zafiroglu requires a substantial amount of solid diluent, Zafiroglu arguably teaches against the instant claim limitation. The reference nowhere teaches or suggests that an excess of particles should be included, such that the bag cannot allow all of the particles to achieve a fully swollen state. The reference also fails to teach or suggest any benefits that could be provided thereby.

Zafiroglu thus does not teach or suggest, and in fact teaches away from, the instant claim limitation. Zafiroglu does not teach or suggest any reason to modify the disclosed article to provide such an excess of polymer particles, as claimed.

Accordingly, the claimed invention of claims 23 and 24 would not have been obvious over Zafiroglu. Reconsideration and withdrawal of the rejection are respectfully requested.

D. Claims 2, 8-9, 11, 14-15, 17 and 20 Would Not Have Been Obvious Over Zafiroglu in View of Goldman

Claims 2, 8-9, 11, 14-15, 17 and 20 are rejected under 35 U.S.C. §103(a) over Zafiroglu in view of Goldman. Claim 1, from which claims 2, 8-9, and 11 depend, is discussed above. Claim 14, from which claims 15, 17 and 20 depend, in relevant part contains the same limitations as claim 1. The Examiner argues that Zafiroglu discloses all of the limitations of the rejected claims, and that Goldman discloses the specific nonwoven thermoplastic fibers of the claims. Applicants respectfully disagree.

In relevant part, independent claims 1 and 14 specify that the article comprises a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water. The claims also require that the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state. Such articles are nowhere taught or suggested by the cited references.

As discussed in detail above, neither Zafiroglu nor Goldman teaches or suggests the limitation in independent claims 1 and 14 that the amount of polymer particles enclosed in the bag is in excess compared to that which would be just required to fill up the bag when they are in the full swollen state. This limitation indicates that the bag contains a sufficient amount of particles such that the volume limitation of the bag will constrain all of the particles from achieving the full swollen state, because there is insufficient room in the bag to allow all of the particles to achieve the full swollen state. As a result, when the article is wetted with water, the particles absorb water and swell. However, because of the excess

amount of polymer particles, and of the restricted internal volume of the envelope (or bag), some of the polymer particles cannot swell completely.

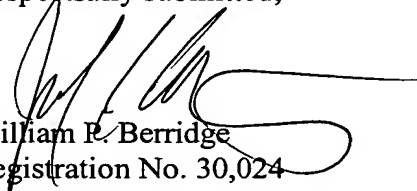
Zafiroglu and Goldman both fail to teach or suggest at least the limitation regarding the excess amount of polymer particles. Nor do the references teach or suggest any reason to modify the disclosed articles to provide such an excess of polymer particles. Although Zafiroglu and Goldman teach that the respective articles contain swellable particles, the references are silent with respect to the amount of swellable particles in relation to the volume of the bag containing the particles. The references nowhere teach or suggest that an excess of particles should be included, such that the bag cannot allow all of the particles to achieve a fully swollen state. The references also fail to teach or suggest any benefits that could be provided thereby.

Accordingly, one of ordinary skill in the art based on the cited references would not have been motivated to practice the claimed invention.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1-5, 7-18 and 20-25 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 1-5, 7-18 and 20-25.

Respectfully submitted,



William R. Berridge
Registration No. 30,024

Joel S. Armstrong
Registration No. 36,430

WPB:JSA

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1. (Previously Presented) An article with cooling capability by water desorption from a water-swollen gel, comprising:

a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls,

wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water, and

wherein the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state.
2. (Original) An article according to claim 1, wherein said polymer has a sodium polyacrylate base.
3. (Original) An article according to claim 1, wherein said envelope is made of a cotton woven textile fabric.
4. (Original) An article according to claim 1, wherein said envelope is made of a cotton-viscose woven textile fabric.
5. (Original) An article according to claim 1, wherein said envelope is made of a non-woven fabric of viscose and polyester fibers.
6. (CANCELED)

7. (Previously Presented) An article according to claim 1, wherein said excess is from 5 to 10 percent by weight of the theoretical amount required to just fill the bag completely.

8. (Previously Presented) An article according to claim 1, wherein said envelope is made of a non-woven fabric comprising longer threads or fibers of natural or semi-synthetic nature and shorter polyester fibers, the respective proportions expressed as weight percentages being from 70 to 90 percent for the latter and from 10 to 30 percent for the former in the total weight of the non-woven fabric.

9. (Original) An article according to claim 8, wherein said longer threads or fibers are made of a cellulosic material.

10. (Original) An article according to claim 8, wherein said longer threads or fibers are viscose fibers.

11. (Original) An article according to claim 8, wherein said shorter fibers are polypropylene fibers.

12. (Previously Presented) An article according to claim 1, wherein said envelope is made of a non-woven fabric comprising longer threads or fibers of viscose and shorter polypropylene fibers, the respective proportions expressed as weight percentages being from 70 to 90 percent for the latter and from 10 to 30 percent for the former in the total weight of the non-woven fabric.

13. (Previously Presented) A method for relieving pain from a sore part of an individual's body with a cooling article comprising a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls, wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer

sequences for retarding diffusion of water from a particle to another during desorption of absorbed water, said method comprising:

wetting said polymer particles with water through said envelope during a sufficient time to swell them into a gel mass filling up said bag, and

applying said article on said sore part of the individual's body maintaining an inner wall in close contact thereon while allowing water vapor desorbed from said particles to escape through an opposed outer wall of said envelope.

14. (Previously Presented) An article with cooling capability by water desorption from a water-swollen gel, comprising:

a polymer absorbent enclosed within a bag delimited by a collapsible envelope having non-watertight walls and made of a non-woven fabric comprising longer threads or fibers of natural or semi-synthetic nature and shorter polyester fibers,

wherein said polymer absorbent is in particulate form wherein each particle comprises a core of less cross-linked polymer sequences for retaining absorbed water and a shell of more cross-linked polymer sequences for retarding diffusion of water from a particle to another during desorption of absorbed water, and wherein said polymer absorbent has a sodium polyacrylate base, and

wherein the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state.

15. (Original) An article according to claim 14, wherein said longer threads or fibers are made of a cellulosic material.

16. (Original) An article according to claim 14, wherein said longer threads or fibers are viscose fibers.

17. (Original) An article according to claim 14, wherein said shorter fibers are polypropylene fibers.

18. (Previously Presented) An article according to claim 14, wherein said envelope is made of a non-woven fabric comprising longer threads or fibers of viscose and shorter polypropylene fibers, the respective proportions expressed as weight percentages being from 70 to 90 percent for the latter and from 10 to 30 percent for the former in the total weight of the non-woven fabric.

19. (CANCELED)

20. (Previously Presented) An article according to claim 14, wherein said excess is from 5 to 10 percent by weight of the theoretical amount required to just fill the bag completely.

21. (Previously Presented) An article according to claim 1, wherein the article relieves pain from a sore part of an individual's body by a cooling effect.

22. (Previously Presented) An article according to claim 14, wherein the article relieves pain from a sore part of an individual's body by a cooling effect.

23. (Previously Presented) A method according to claim 13, wherein the amount of polymer particles enclosed in the bag is in excess compared to the theoretical amount that would be just required to fill up the bag when they are in the full swollen state.

24. (Previously Presented) A method according to claim 23, wherein during said applying, non-fully swollen particles of said polymer absorbent are disposed close to the walls of the bag to absorb traces of moisture penetrating into the bag through the envelope.

25. (Previously Presented) A method according to claim 13, wherein said sore part of the individual's body is normally dry.

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE